EDITORIAL AND COMMENT

Screening Tests for Osteoporosis: Too Few for Some, Too Many for Others

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The science of preventing fractures has advanced dramatically over the last 30 years. During that time span, the incidence and key risk factors have been defined, accurate and accessible diagnostic imaging has been introduced and refined, validated clinical risk tools have been developed and propagated, and potent anti-fracture treatments have been tested, approved and found to be relatively safe for at least 3–5 years of use. An enormous number of clinical research studies, both observational and randomized trials, provide solid evidence to support the existing clinical practice guidelines, which generally agree with respect to when osteoporosis screening and treatment are indicated. For example, both the US Preventive Services Task Force (USPSTF) and the National Osteoporosis Foundation (NOF) guidelines^{1,2} recommend dual-energy X-ray absorptiometry (DXA) screening for all women 65 years of age or older and all younger postmenopausal women with increased risk, and the NOF guidelines further recommend pharmacologic therapy for all women with osteoporotic DXA results (T score less than -2.5) and those with high predicted 10-year risk of hip ($> 3\%$) or major osteoporotic fracture ($> 20\%$).

Even with these important advances, large numbers of osteoporotic individuals are never identified or treated,³ and despite the growing population of elderly men and women in the US, the number of prescriptions for effective osteoporosis treatments has declined 30% since 2006.⁴ The decline in prescriptions may, in part, reflect patient and provider concerns about rare but serious complications of long-term bisphosphonate therapy.⁵ Even the osteoporotic equivalent of “low-hanging fruit”, anti-fracture therapy for high-risk individuals following a recent fracture, is not consistently addressed and managed well by clinicians in most health care delivery systems. Fewer than 20% of patients with an osteoporotic fracture receive effective treatment in the following year.³

Although multiple factors likely contribute to the suboptimal evaluation and management of patients with high fracture risk, the important study in this issue of JGIM by Amarnath

et al.⁶ addresses one of the key issues: do those who need DXA screening receive it, and do those who do not need to be screened end up being tested anyway? To determine the extent to which DXA screening was used in accordance with USPSTF recommendations at 13 university-affiliated primary care clinics in northern California, the investigators performed a retrospective cohort study of nearly 51,000 actively followed women aged 40–85 without prior DXA screening. After accounting for sociodemographic variables, comorbidities, previous fractures, and a number of other potential confounding factors, the authors found that the cumulative incidence of DXA screening among women aged 65–74 was only 58%, and even fewer women 75–85 years of age were screened (43%). Equally notable were the rates of DXA screening among those without a clear indication by current guidelines; the 7-year cumulative incidence of DXA screening among women aged 50–59 without fracture risk factors was 45%, and among those aged 60–69 without risk factors, 59% were screened.

Admittedly, these data only relate to one health care delivery system in one geographic area, and the results might differ elsewhere. Although the study did not capture several less common risk factors that could lead to screening women < 65 years of age, such as Parkinson’s disease, stroke, or history of hip fracture among first-degree relatives, the reported rates of over- and under-screening are similar to those in previous reports⁷ and are likely representative of most traditional multispecialty practices in the US.

There may be several explanations for the observed overuse and underuse of DXA screening, and additional analyses by Amarnath et al. provide some important insights related to DXA underutilization. First, even after adjustment for comorbidity, women over age 75 were less likely to receive DXA screening despite the fact that the absolute benefits of screening and treatment increase with advancing age.⁸ Second, compared to white women, black women were less likely to be screened, as were those with Medicaid insurance compared to those with other types of health insurance. Women with five or more primary care or specialty visits in a year were more likely to be screened. Interestingly, women who underwent mammographic screening were three times as likely to undergo DXA screening. Unfortunately, the study by Amarnath et al. provides little information for those who received unindicated DXA screening, such as the specialty of the ordering provider or the impact of patient preferences and requests.

What can be done to improve the appropriate use of DXA in clinical practice? As Amarnath et al. point out, improved information technology itself is unlikely to help without additional educational interventions directed at both patients and providers regarding the benefits (and risks) of fracture prevention strategies. User-friendly electronic medical records systems that identify high-risk patients and allow accurate and timely provider feedback regarding both under- and over-utilization of DXA are needed. Since primary care providers are already overwhelmed with the provision of indicated preventive services, in most settings, DXA screening logistics can be largely automated or delegated to trained support staff. Excellent patient education materials are also available from the NIH (www.niams.nih.gov/health_info/Bone/Osteoporosis/osteoporosis_hoh.asp) and the NOF (<https://my.nof.org/bone-source/resources-for-patients>).

In summary, despite multiple widely disseminated practice guidelines, there continues to be evidence of significant underuse of DXA screening in postmenopausal women, particularly among those > 75 years of age, black women, and women who do not receive other age-appropriate screening tests such as mammography. Far less is known about the determinants of over-utilization of DXA, not only among those who do not have an indication for screening DXA before age 65 but also among those with at least one previously normal DXA test⁹ and those being treated with effective anti-fracture therapies.¹⁰ The bottom line seems to be that a great number of women who need screening DXA do not receive it, while a substantial proportion of those without a clear indication needlessly receive it. Futures studies should further refine the patient and provider characteristics associated with over- and under-utilization of DXA, and those studies should be followed by targeted interventions designed to get the right test to the right person at the right time.

Conflict of Interest: The author declares that he does not have a conflict of interest.

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